



PERFORMANCE CHANGES IN WOMEN'S HANDBALL PLAYERS FOLLOWING TWO DIFFERENT TRAINING PERIODIZATION MODELS

Manchado, C., Tortosa-Martínez, J., Cortell-Tormo, J., Caus-Pertegaz, N.
University of Alicante, Spain



Introduction

Training periodization is the strategy to promote long-term training and performance improvements with pre-planned, systematic variations in training specificity, intensity, and volume organized in periods or cycles within an overall program.

- Empirical information comparing training periodization models is very limited
- Most of the research to date has been conducted in individual endurance sports.
- There are no published scientific studies exploring their effectiveness when applied to team sports, such as handball (HB)

This study was undertaken to compare training-induced changes in selected physiological, body composition and handball key performance factors following two different training periodization models: traditional (TP) versus block periodization (BP).



Methods

Eleven female HB players from a first league team were assessed four times during a training cycle over two consecutive seasons.

Chronological schedule of the test protocol application	
Session 1	Session 2
Anthropometry test (Height, body mass, BMI) Vertical jump test (SJ and CMJ) Sprint test (20m) Maximal isometric hand grip force test Maximal dynamic strength test (1RM) Upper bench press (BPr) and lower half-squat (HS)	Throwing velocity test (4 different throws with and without GK) Incremental treadmill test to exhaustion (VO_{2max})

Experimental design

Summary of training plan (main training targets-testing calendar for both cycles)

First week August Season 1	August-November			Last week November Season 1	First week August Season 2	August-November			Last week November Season 2
	LIT	MIT	TTS			HIT	SSE	TTS	
	GS	MP	SSE			MSt	TTS	MS	
	BT	TeP	SSSP			TeP	MP	SSSP	
		TTS							
		MS							
Week	1-4	5-8	9-16	17		1-5	6-10	11-16	17
T _{TP0}	GP	SP	C	T _{TP1}	T _{BP0}	A	T	R	T _{BP1}
TP model					BP model				
<p>LIT=low intensity endurance training; MIT= Medium intensity endurance training; HIT=high intensity endurance training; SSE=sport-specific endurance; GS=general strength; MSt=Maximal strength; MP=maximal power; SSSP=sport-specific strength and power; TeP=technique perfection; TTS=techno-tactical skills; BT=basic technique; MS=maximal speed</p>									

Statistics

Univariate (ANOVA) and multivariate (MANOVA) analysis of variance of repeated measures were performed

Main results

Mean and standard deviations values ($\bar{x} \pm sd$) correspondent to fitness characteristics of the players								
Variables	T _{TP0}	T _{TP1}	% Variation	SE	T _{BP0}	T _{BP1}	% Variation	SE
Fitness Characteristics								
SJ (cm)	22.9 ± 3.5	23.6 ± 4.0	3.04	0.12	24.4 ± 4.2	26.6 ± 4.0*	9.01	0.53
CMJ (cm)	25.8 ± 3.9	26.1 ± 3.9	1.13	0.07	26.6 ± 4.9	29.2 ± 4.3*	9.89	0.37
VO _{2max} (ml/kg/min)	44.9 ± 5.3	46.9 ± 6.0	2	0.19	45.8 ± 4.5	48.1 ± 4.6	4.9	0.49
20m sprint	3.37 ± 0.2	3.22 ± 0.1	1.39	0.31	3.33 ± 0.2	3.28 ± 0.2**	4.32	1.07
Half Squat	118.0 ± 27.9	137.5 ± 34.4*	16.48	0.62	120.9 ± 25.1	151.4 ± 31.2*	25.26	1.08
Bench press	39.3 ± 8.3	43.6 ± 7.8*	10.9	0.53	34.5 ± 8.1	40.1 ± 8.3*	16.04	0.70
Throwing velocity (Km/h)								
Throwing velocity	69.8 ± 6.0	69.5 ± 6.0	-0.6	0.17	65.0 ± 6.9	68.4 ± 7.7*	5.05	0.42

Legend: significant differences ()p<0.05 (**) p<0.001. Size Effect (SE)=0.20 small, 0.50 moderate, 0.80 large*

Conclusion

These findings suggest that BP may be more effective than TP for improving the most important HB performance factors in a Spanish first league women's HB team.